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PATENT
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Applicants: PUI et al.	)	Group Art Unit: 1762
Serial No.: 10/809,660	)	Examiner: JAMES S. KETTER
Confirmation No.: 7495	)	
Filed: March 25, 2004	)	

For: ELECTROSPRAYING APPARATUS AND METHOD FOR COATING PARTICLES

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X **Small Entity Status is entitled to be asserted in the above-identified application.**

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system to be used.

D. Electrostatic System

The finely divided powder is uniformly distributed on the surface of the detergent granules by means of an electrostatic charging and delivery system. U.S. Patent 4,780,331, Cobbs, Jr. et al., issued October 25, 1988, incorporated herein, describes a particular method and apparatus for charging powder particles by electrostatic induction. Generally, the electrostatic charging system contains electrodes which ionize the air surrounding them. The finely divided powder is passed by these electrodes and acquires the ionic charges. The powder is then distributed in the area of the detergent granules. Because of the electrostatic charges, the powder is attracted to and uniformly distributed on the surfaces of the detergent granules. It is not necessary to charge the detergent granules. The detergent granules need not be grounded but the object which contains them, preferably a rotating mix drum, should be grounded or polyethylene coated for safety. When the detergent granules are glutinous during the powder application, there is no need for a curing or fusion step to ensure long-term adhesion of the powder.

The preferred electrostatic system for use herein is an electrostatic powder spray gun. An electrostatic powder spray gun is described in U.S. Patent 4,380,320, Hollstein et al., issued April 19, 1983, incorporated herein. This step preferably comprises charging the finely divided powder in an electrostatic powder spray gun and then spraying the charged finely divided powder from the gun onto the detergent granules.

The most preferred electrostatic powder spray gun for use herein has three parts: a gravity feed hopper, a control console, and the gun itself. The finely divided powder is fed into the gravity feed hopper. The control console has controls for regulating flow rate, fluidizing rate, atomizing rate and voltage level. The type of powder used generally controls which rate settings give the best results. The finely divided powder is channeled from the gravity feed hopper into the central passageway of the gun. Pressurized gas forces the powder through the passageway, where the powder acquires an electrostatic charge and, when a trigger on the gun is pressed by an operator, the charged powder is emitted from the gun in a conical spray pattern.

It is preferred that the electrostatic powder spray gun be mounted on a rotating mix drum. The nozzle of the gun is preferably pointed through an opening in the drum. The detergent granules are preferably falling freely when the cloud of charged powder particles is emitted from the gun. The charged powder particles are attracted to the detergent granules and are uniformly distributed on the surfaces of the granules. Any other method for holding the granules in the area of the charged powder particles may be used; for example, allowing the detergent granules to fall down a chute while spraying them with the charged finely divided powder. The rotary mix drum or chute should be grounded or coated with polyethylene in a manner sufficient to minimize fire and safety hazards.

Using electrostatics to uniformly coat detergent granules with finely divided powder so that they are free-flowing and do not cake or lump has the following advantages over conventional admixing methods:

(a) uniform, complete coverage of the granules,

(b) less finely divided powder is required,

(c) reduced dust and less powder recycle, and

(d) where the granules are glutinous, more permanent adhesion between the finely divided powder and the granule leading to a longer lasting coating.

Detergent granules made by this process can be used as is as a finished granular detergent composition. Alternatively, the instant coated detergent granules can be mixed with other ingredients, such as other detergent granules or builders, to form a granular detergent composition.

The following nonlimiting examples illustrate the process and coated detergent granules of the present invention. All parts, percentages and ratios herein are by weight unless otherwise specified.